

PCT/US04/05659
Attorney Case L3799-01

10/547443

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INTERNATIONAL APPLICATION NO.: PCT/US04/05659
IN RE APPLICATION OF: MARYSUSAN M. COUTURIER
INTERNATIONAL FILING DATE: 26 FEBRUARY 2004 (26.02.2004)
TITLE: ERUCAMIDE-FREE CLOSURE
AND LINER COMPOSITIONS
ATTORNEY CASE NO.: L3799-01

RESPONSE TO WRITTEN OPINION

MAIL STOP PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Written Opinion mailed September 30, 2004, in the above-identified application, Applicant submits the following amendments and request that they be entered into the application.

Amendments to Specification begin on page 2 of this document.

Amendments to Claims begin on page 3 of this document.

Statement and Remarks begin on page 7 of this document

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Craig K. Leon, Esq.

November 18, 2004
Signature Date

Amendments to Specification

In the specification (page 7, line 8, second line below Table 2), replace
"unsaturated" with --saturated--

In the specification (page 3, line 11), replace "carboxylated styrene butadiene"
with --carboxylated styrene butadiene block copolymer--

Claim Amendments

1. (currently amended) A composition, comprising:

(A) a matrix polymer, copolymer, or blend thereof, which is essentially free of erucamide, and which is essentially free of unsaturated amide, and which is operative to provide a container, container closure, or closure sealant, said matrix polymer, copolymer, or mixture thereof being selected from thermoplastic polymers consisting of polyethylene or ethylene copolymer with other lower alkenes, polypropylene, thermoplastic rubber, poly(ethylene propylene) copolymer, acid modified ethylene propylene copolymer, styrene butadiene rubber, carboxylated styrene butadiene block co-polymer, polyisoprene, styrene isoprene styrene block copolymer, styrene butadiene styrene block copolymer, styrene ethylene butylene styrene block copolymer, polystyrene block polyethylene/propylene copolymer, ethylene vinyl acetate copolymer or terpolmer, ethylene acrylate copolymer or terpolymer, ethylene vinyl alcohol copolymer, butyl rubber, and poly(vinyl chloride) polymer;

(B) a ~~silicone~~ lubricant comprising an organopolysiloxane, said organopolysiloxane having an average molecular weight not less than 40,000, said organosiloxane ~~silicone lubricant~~ being present in said composition in an amount not less than .01 parts and not greater than 10 parts based on 100 parts of said base polymer(s) matrix polymer, copolymer, or blend thereof which comprises said component (A), and said organopolysiloxane having a viscosity of at least 50,000 cst; and

(C) a slip aid comprising a saturated amide and an oxidized polyethylene, said slip aid being present in said composition in an amount not less than 0.01 parts and not greater than 8 parts based on 100 parts of said component (A), said amide having an iodine value no greater than 5 in accordance with ASTM D2075-92;

said composition when employed in a container, container closure, or closure sealant providing reduced off-tastes while maintaining slip-aid efficiency when compared to compositions containing unsaturated amide.

2. (currently amended) The composition of claim 1 comprising wherein at least two of said thermoplastic polymers or copolymers ~~said component A~~ ~~comprises thermoplastic polymers such as polyethylene or ethylene copolymer with~~

~~other lower alkenes, polypropylene, thermoplastic rubbers, ethylene propylene copolymers, acid modified ethylene propylene copolymers, styrene butadiene rubber, carboxylated styrene butadiene, polyisoprene, styrene isoprene styrene block copolymers, styrene butadiene styrene block copolymers, styrene ethylene butylene styrene block copolymers, polystyrene block polyethylene/propylene copolymers, polystyrene block polyethylene propylene polystyrene copolymers, polystyrene block polyethylene ethylene propylene styrene copolymers polystyrene, ethylene vinyl acetate copolymers and terpolymers, ethylene acrylate co and terpolymers ethylene vinyl alcohol copolymers, butyl rubber, ethylene acid copolymers, polyvinyl chloride polymers, said polymer or copolymers being 100% of said component (A).~~

3. (currently amended) The composition of claim 1 wherein said matrix polymer, copolymer, or blend thereof comprises an ethylene vinyl acetate copolymer in an amount not less than 5 parts and not greater than 100 parts, based on 100 parts of said component (A).

~~3 4.~~ (currently amended) The composition of claim 1 3 wherein said matrix polymer, copolymer, or blend thereof further comprises polyethylene, polypropylene, or blend thereof.

~~4 5.~~ (currently amended) The composition of claim 4 3 wherein said matrix polymer, copolymer, or blend thereof comprises a copolymer of polyethylene and polypropylene.

~~5 6.~~ (currently amended) The composition of claim 1 wherein said ~~silicone lubricant~~ organopolysiloxane is poly(dimethyl) siloxane.

~~6 7.~~ (cancelled)

~~7 8.~~ (cancelled)

~~8 9.~~ (cancelled)

~~9 10.~~ (cancelled)

~~10 11.~~ (currently amended) The composition of claim 1 wherein said ~~slip aid~~ is a saturated amide is selected from the group consisting of behenamide, stearamide, arachidamide, palmitamide, myristamide, lauramide and ethylene bis-stearamide.

~~11~~ 12. (cancelled)

~~12~~ 13. (cancelled)

~~13~~ 14. (currently amended) The composition of claim 11 ~~10~~ wherein said saturated amide is stearamide.

~~14~~ 15. (currently amended) The composition of claim 11 ~~10~~ wherein said saturated amide is behenamide.

~~15~~ 16. (cancelled)

~~16~~ 17. (currently amended) The composition of claim 1 being molded into a beverage container.

~~17~~ 18. (currently amended) The composition of claim 1 being molded into a beverage container closure.

~~18~~ 19. (currently amended) The composition of claim 18 ~~16~~ wherein said beverage container closure is a plastic cap.

~~19~~ 20. (currently amended) The composition of claim 1 being molded into a cap liner.

~~20~~ 21. (cancelled)

22. (new) The composition of claim 1 wherein said matrix polymer comprises ethylene vinyl acetate copolymer, and further comprises poly(ethylene propylene copolymer).

23. (new) The composition of claim 1 wherein said ethylene vinyl acetate copolymer or terpolymer and said poly(ethylene propylene) copolymer constitute 100% of said matrix polymer.

24. (new) The composition of claim 22 wherein said saturated amide is stearamide.

25. (new) The composition of claim 24 wherein said organopolysiloxane is poly(dimethyl)siloxane.

26. (new) The composition of claim 1 wherein said matrix polymer comprises poly(vinyl chloride) polymer.

27. (new) The composition of claim 26 wherein said poly(vinyl chloride) polymer constitutes 100% of said matrix polymer.

28. (new) The composition of claim 1 wherein said matrix polymer comprises polyethylene, polypropylene, or mixture thereof; and said matrix polymer further comprises styrene ethylene butylene styrene block copolymer.

Statement

Where originally there were originally "20" claims (but in reality 21 claims), claims 4-21 were re-numbered to correct the misnumbering; claims 1-6, 11, 14-15, 17-20 are amended; new claims 22-28 are added (which are based on particular polymers in claims 1 or 2); and re-numbered claims 7-10, 12-13, 16, and 21 were cancelled; thus, claims 1-6, 11, 14, 17-20, and 22-28 are re-numbered as 1-20 and set forth in the Substitute Pages attached herewith.

Remarks

Amendments to the specification at page 7, line 8, and page 3, line 3, have been made in accordance with the suggestions proposed by Examiner Kuo-Liang Peng on July 20, 2004, in corresponding Serial No. 10/379,749. Substitute Pages 3 and 7 are therefore attached hereto.

Amendments to the claims have been made in accordance with suggestions proposed by Examiner Kuo-Liang Peng's suggestion made on July 20, 2004, in corresponding Serial No. 10/379,749, and the allowed claims based on amendments filed by Applicant on May 6, 2004. As mentioned in the Statement above, new claims 22-28 (renumbered as 14-20) incorporate specific polymers from claim 1 and thus do not incorporate any new matter. Substitute Pages 9-12 containing the claims 1-20 as amended are therefore attached hereto.

Finally, the observations set forth in Box No. VIII regarding claims 2, 4, and 21 have been taken into account either through claim amendments (#2, #4) or cancellation (#21).

Original claims 1-8, 11-15, and 17-21 were said to lack novelty under PCT Article 33(2) as anticipated by Knight (EP 0 129 309) as evidenced by Freeman.

In response, Applicant amends claim 1 to incorporate selected polymers and copolymers from claim 2, and to specify that the lubricant is an organosiloxane as previously identified in claim 7, now cancelled. Claim 1 is further amended to describe that the lubricant has a viscosity of at least "50,000 cst" as described in the specification at page 4, line 9. Claim 1 is further amended to describe that the slip aid comprises both the saturated amide and the oxidized polyethylene, as supported in claims 8-10 and 16, now cancelled. Additionally, Claim 1 is amended to describe that the saturated amide has an iodine value no greater than 5 in accordance with ASTM D2075-92, as described in the specification at page 3, lines 22-24, and also in claims 12-13, now cancelled.

Knight mentions only silicone oil and fatty amide (col. 5, ll. 61-63); polysiloxane (example 1); silicone and oleamide (example 2); and silicone oil and fatty amide (examples 4-5). Knight appears to prefer using oleamide, which is an unsaturated amide. He does not teach or suggest an organosiloxane with a saturated amide and an oxidized polyethylene, as presently claimed (See claim 1 as amended above).

Freeman describes viscosity and degree of polymerization of polydimethylsiloxane, but does not provide any suggestion to substitute the silicone oil of Knight with polydimethylsiloxane and does not provide any suggestion to combine this with a saturated amide and oxidized polyethylene, as presently claimed.

Thus, neither Knight nor Freeman, whether considered individually or in combination, can support a rejection under PCT Article 33(2).

Nor can they support any rejection under PCT Article 33(3) because they fail to suggest selecting the Applicant's particularly claimed components which are intended to decrease off-flavors while achieving slip aid efficacy in container closures and sealants which are essentially free of erucamide and other unsaturated amide slip aids. Certainly, Knights' preference for oleamide (unsaturated), as demonstrated in his examples, would lead one away from the presently claimed invention.

The Article 33(2) rejection over Knight and Freeman is believed to be overcome and should be withdrawn.

* * *

Original claims 1-14 and 16-21 were rejected PCT Article 33(3) in view of Couturier US 4,870,128 and Knight EP 0,129,309.

As discussed above, Knight prefers silicone oil with a fatty amide, such as oleamide (unsaturated). Again, this would lead one away from particularly combining an organosiloxane with a saturated amide slip aid. Again, Knight can not be deemed to teach or suggest an organosiloxane with both a saturated amide and an oxidized polyethylene, as presently claimed.

Couturier (US 4,870,128) does not supply the missing suggestion to combine an organosiloxane with a saturated amide and oxidized polyethylene in order to decrease off-flavors while maintaining slip aid efficacy as presently claimed.

One of Couturier's objectives is to achieve a hot melt gasket with superior cracking and cut-through resistance, especially at elevated temperatures and excessive headloads (col. 1, ll. 42-44), and to achieve this by employing a copolymer of ethylene and an olefinic carboxylic acid, particularly a co-polymer of ethylene and acrylic acid or ethylene and methacrylic acid (col. 1, ll. 45-col. 2, l. 14).

Thus, to further distinguish Couturier '128 from the present invention, Applicant incorporates, into the language of claim 1, certain polymers and copolymers originally listed in claim 2; but omits "ethylene acid copolymers" from the claims.

Thus, Applicant submits that the PCT Article 33(3) rejection based on Couturier and Knight is overcome and should be withdrawn.

Applicant believes that it would not "have been obvious to one of ordinary skill in the art at the time of invention to choose and try Knight's organopolysiloxane in Couturier's composition with expected success." This is because Couturier lists over 35 possible lubricants, so that --as a mathematical proposition-- the chances of selecting the three particular lubricants of the present invention and of combining them to fall within the present claim scope would require around 39,720 experiments. Applicant believes that any company researcher who would embark on such experiments would quite probably lose his/her job.

In view of the foregoing amendments and remarks, Applicant believes that the PCT Article 33(3) rejection over Couturier and Knight is overcome and should be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant requests the issuance of a favorable International Preliminary Examination Report.

Respectfully submitted,



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Detailed Description of Exemplary Embodiments.

As summarized above, exemplary compositions comprise a matrix polymer having essentially no erucamide or unsaturated amide; a silicone lubricant; and slip aid having a saturated amide, oxidized polyethylene, or mixture thereof.

The matrix polymer, copolymer, or blend thereof may be selected from those conventionally known for use in making containers, container closures, or closure sealants. For example, these include thermoplastic polymers such as polyethylene or ethylene copolymer with other lower alkenes, polypropylene, thermoplastic rubbers, ethylene propylene copolymers, acid modified ethylene propylene copolymers, styrene butadiene rubber, carboxylated styrene butadiene block copolymer, polyisoprene, styrene isoprene styrene block copolymers, styrene butadiene styrene block copolymers, styrene ethylene butylene styrene block copolymers, polystyrene block polyethylene/propylene copolymers, polystyrene block polyethylene propylene polystyrene copolymers, polystyrene block polyethylene ethylene propylene styrene copolymers polystyrene, ethylene vinyl acetate copolymers and terpolymers, ethylene acrylate co and terpolymers ethylene vinyl alcohol copolymers, butyl rubber, ethylene acid copolymers, and polyvinyl chloride polymers.

Compositions of the invention should be essentially free of erucamide and which is essentially free of unsaturated amide. In other words, amides contained in the composition should have an iodine value no greater than 10 and more preferably no greater than 5. The iodine value is a measure of the unsaturation of alkyl groups and can be measured using the Wjis procedure, such as ASTM D2075-92, among others.

Typical examples for closure liners are described in, for instance, US 5104710, EP 0478109, EP 0599356, EP 0488491, and 0646158. The liners may be applied to the closure in any of the known methods, such as those described in, for example, US 4518336, EP 207385, and US 4277431.

Typical examples for closures are described in, for example, US 5045594, US 5186991, US 6399170, WO 0162837, EP 73334, and US 4462502.

The addition of silicones to container closure and closure sealant compositions are not new, and examples of can be found in EP 129309. However, they are used in conjunction with an unsaturated amide(s) to provide the ability to lessen removal torque.

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Example 2

In accordance with the procedure described above for Example 1, the following compositions were applied to caps and tested, as shown in Table 2 below.

Table 2

	A	B	C
EVA	90	90	90
EP	10	10	10
AO	.1	.1	.1
BLUE	.8	.8	.8
Si3	3	3	0
Si2	0	0	1.5
SR	0	1	1
OXF	1.5	0	.5
REMOVAL TORQUE, IN-LB.	13.6	10.3	12.0
STRINGING/ SCUFFING	0 %	0 %	14 %

This data indicates that by utilizing a mixture of siloxanes and ethylenically saturated amides and/or oxidized polyethylene, in combination, provided performance equal to that of erucamide.

Example 3

In another example, compositions similar to above were extrusion blended and pelletized. The pellets were then melted in another extruder, and the molten pellets were transferred directly from the extruder to the individual cap and immediately compression-molded.

The resulting lined caps were allowed to age at room temperature for a minimum of 1 week prior to testing. The caps were then applied to 20 oz. PET bottles filled with water using a commercial application machine. The bottles were stored at 40°F for less than week and more than 24 hours. After this period, tests were performed to measure the force required to remove the cap, and any tearing, scuffing or stringing of the liner was noted.

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1. A composition, comprising:

(A) a matrix polymer, copolymer, or blend thereof, which is essentially free of erucamide, which is essentially free of unsaturated amide, and which is operative to provide a container, container closure, or closure sealant, said matrix polymer, copolymer, or mixture thereof being selected from thermoplastic polymers consisting of polyethylene or ethylene copolymer with other lower alkenes, polypropylene, thermoplastic rubber, poly (ethylene propylene) copolymer, acid modified ethylene propylene copolymer, styrene butadiene rubber, carboxylated styrene butadiene block copolymer, polyisoprene, styrene isoprene styrene block copolymer, styrene butadiene styrene block copolymer, styrene ethylene butylene styrene block copolymer, polystyrene block polyethylene/propylene copolymer, ethylene vinyl acetate copolymer or terpolmer, ethylene acrylate copolymer or terpolymer, ethylene vinyl alcohol copolymer, butyl rubber, and poly(vinyl chloride) polymer;

(B) a lubricant comprising an organopolysiloxane, said organopolysiloxane having an average molecular weight not less than 40,000, said organosiloxane being present in said composition in an amount not less than .01 parts and not greater than 10 parts based on 100 parts of said matrix polymer, copolymer, or blend thereof which comprises said component (A), and said organopolysiloxane having a viscosity of at least 50,000 cst; and

(C) a slip aid comprising a saturated amide and an oxidized polyethylene, said slip aid being present in said composition in an amount not less than 0.01 parts and not greater than 8 parts based on 100 parts of said component (A), said amide having an iodine value no greater than 5 in accordance with ASTM D2075-92;

said composition when employed in a container, container closure, or closure sealant providing reduced off-tastes while maintaining slip-aid efficiency when compared to compositions containing unsaturated amide.

2. The composition of claim 1 comprising at least two of said thermoplastic polymers or copolymers.

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3. The composition of claim 1 wherein said matrix polymer, copolymer, or mixture thereof comprises an ethylene vinyl acetate copolymer in an amount not less than 5 parts and not greater than 100 parts, based on 100 parts of said component (A).

4. The composition of claim 1 wherein said matrix polymer, copolymer, or mixture thereof comprises polyethylene, polypropylene, or blend thereof.

5. The composition of claim 4 wherein said matrix polymer, copolymer, or mixture thereof comprises a copolymer of polyethylene and polypropylene.

6. The composition of claim 1 wherein said organopolysiloxane is poly(dimethyl) siloxane.

7. The composition of claim 1 wherein said saturated amide is selected from the group consisting of behenamide, stearamide, arachidamide, palmitamide, myristamide, lauramide and ethylene bis-stearamide.

8. The composition of claim 7 wherein said saturated amide is stearamide.

9. The composition of claim 7 wherein said saturated amide is behenamide.

10. The composition of claim 1 being molded into a beverage container.

11. The composition of claim 1 being molded into a beverage container closure.

12. The composition of claim 11 wherein said beverage container closure is a plastic cap.

13. The composition of claim 1 being molded into a cap liner.

14. The composition of claim 1 wherein said matrix polymer comprises ethylene vinyl acetate copolymer, and further comprises poly(ethylene propylene copolymer).

15. The composition of claim 1 wherein said ethylene vinyl acetate copolymer or terpolymer and said poly(ethylene propylene) copolymer constitute 100% of said matrix polymer.

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16. The composition of claim 14 wherein said saturated amide is stearamide.
17. The composition of claim 16 wherein said organopolysiloxane is poly(dimethyl)siloxane.
18. The composition of claim 1 wherein said matrix polymer comprises poly(vinyl chloride) polymer.
19. The composition of claim 18 wherein said poly(vinyl chloride) polymer constitutes 100% of said matrix polymer.
20. The composition of claim 1 wherein said matrix polymer comprises polyethylene, polypropylene, or mixture thereof; and said matrix polymer further comprises styrene ethylene butylene styrene block copolymer.

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Abstract

An exemplary erucamide-free composition for making container closures or closure sealants includes a matrix polymer, a silicone lubricant such as poly(dimethyl) siloxane, and a slip aid comprising a saturated amide, oxidized polyethylene, or combination thereof.